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EDITORIALS

OUR GOVERNORS

When these pages of the *Agriculturist* are read, Charles Emmet Yeater will have ceased to be Governor General of the Philippine Islands and Leonard Wood will have assumed that place of high service. The one will have gone, the other will have come—both good, both beloved by all.

In the past five years, the formative and critical years of the University, that institution has been nourished by the wise counsel and kind ministry of Mr. Yeater, Secretary of Public Instruction, Member of the Board of Regents, and Governor. He was a frequent visitor on our campus, he climbed our mountain, was often a guest in the homes of our faculty members, a friend of the College, and a strong backer of our University. To the agricultural foundation of the Islands he gave serious and saving attention. To all citizens he stood the Islands' first vital exemplar of true personal democracy. He has left a record of honest fearless government, some phases of which are recorded in documents that constitute the best in Philippine political literature.

General Wood comes with the record of a score of America's important tasks well done, comes in the simplicity of greatness to serve all of us. In the performance of his recent duty as head of President Harding's Philippine Mission he always emphasized the first importance of agriculture and gave careful attention to the matter of land settlement and the just complaints of wronged and defenseless homesteaders. His previous record in colonial administration, which Lord Cromer termed the world's best, is full of instances showing a shrewd understanding and wise application of agrarian policy. And it is on a correct agrarian policy that the future of the Philippines now depends. Our system of public education from the smallest rural school to the University cannot fail to respond to Governor Wood's energetic stimulation. His religion is duty, his creed is action, and his victory is work.

In the presence of Governor Yeater and Governor Wood the humblest civil service employee feels revived and inspired, for they elevate to a high profession the serving of a nation's needs. They speak through all the superficial obscurities and fancies and address themselves to three foundations of service—simplicity, justice, and truth.

THE RANGER

The *Agriculturist* has received a copy of the *Ranger*, Vol. I, No. 3, a highly creditable monthly published by the Filipino Rangers' Association with Mr.

Luis Serrano as editor. The periodical is devoted to the interesting and important subject of forestry; the conservation of forests, and the correct policy for their exploitation.

The Bureau of Forestry and the Rangers' Association are to be complimented on the timely appearance of the *Ranger*, its careful editing, and excellent mechanical make-up. We bespeak the *Ranger* a prosperous and long career in not letting the reading public forget that forestry is an extractive and primary industry, the proper practise of which is fundamental to the growth of the commonwealth.

WHAT IS AGRICULTURAL ENGINEERING

Nature has endowed man with certain prerequisites for living, in the shape of soil, water, air, light, etc., and various forces which we class under one generic name—land.

Nature has endowed man also with muscle, a brain, and a certain amount of will power and ingenuity which economists include under "labor" and "entrepreneurial ability". Nature has further endowed man with certain wants and desires, and has set in the way of his satisfying all these wants, certain bars or hindrances.

Agricultural engineering is the overcoming of these obstacles in so far as they interfere in the winning of production from the soil and the making of the life on the farm or in the farming community, not only bearable, but desirable. The agricultural engineer's problems begin with the clearing of the land, and extend through the stirring of the soil to make a good seed bed, the cultivation and protection of the crop, its harvest, preparation for market, storage, and transportation. Agricultural engineering is concerned with the housing of the farmer and his help; providing proper shelter for his horses, his cattle, his sheep, hogs, and poultry, and his implements.

It is also concerned with establishing and maintaining sanitary conditions, not only for human beings, but for animals and field crops as well. It gives careful consideration to the providing of light and power. In short, Agricultural Engineering undertakes to make use of the natural forces as a means of removing the natural obstacles left by nature and to bring the community into a condition of maximum productiveness, both of commodities necessary for the maintenance of life, those which constitute the decencies of civilization, and those luxuries which make life enjoyable.

No man can be a good agronomist without having some knowledge of engineering applied to agriculture. Much less can an agricultural engineer be successful without having a thorough knowledge of the demands of plant life, the physics of soils, the mechanics of machinery, the principles of sanitation, and transportation. In addition, an appreciation of human nature, together with a sound judgment of economic values, are necessary.

It is possible for a man to have all of these fundamentals and still be a failure or a mediocre unless he is endowed with, and cultivates an indomitable will to succeed. His enthusiasm and determination must increase in proportion to the obstacles which he must face.

HAROLD CUZNER
Of the Department of Engineering.

RICE GROWING PORTRAYED IN CHINESE ART

By Emma S. Yule

Of the Department of English

An evidence of the high esteem in which agriculture is held in China, is the large place the farmer and his occupation have in Chinese art. Two articles in *Asia*,[1] a few months ago, on an old book, *Keng Chi-tu*, are of such unusual interest, as pointing this fact, that a brief review is here given for the benefit of Filipino farmers who may not have been so fortunate as to see the magazine. It is regretted that the twenty illustrations, cuts from the original paintings, given in the articles, cannot be reproduced here, particularly the ten showing the processes of rice growing.

Interesting as the "weaving" pictures are, space compels the confining of the review to the "plowing" pictures. Though of more than ordinary interest, a greater part of the data, stories, and history of these pictures given in the articles, is also omitted.

"Eternal motives are found in the art of the Far East. Among these plowing and weaving hold a high place." This is particularly true in China, and particularly true of farming which has root in the religion as well as in the economic life of the Chinese.

The *Keng Chi-tu* or *Pictures of Plowing and Weaving*, is the work of Lu Shu and appeared about 1145 A. D. A nephew of the author, in an epilogue to an edition in 1210, tells that Lu Shu collected twenty-one pictures of plowing and twenty-four of weaving and the same number of songs related to the pictures. "The pictures were to represent the actual methods of work, but the songs were to express the emotions of the laborers. In the early morning they were sung all the time, everywhere, so that the Emperor asked about their origin." One of the songs that reached the ear of the Emperor is:

THE WATERING OF THE SEED

After the rain of the night, poured bountifully down near the source
of the mountain stream,
Without, before the door, the spring floods swell high.
We dip the woven bamboo baskets into the shallow blue-green stream,
And the bounty-giving grain sends forth its young shoots.

The Chinese looked with scorn upon the Manchus who overthrew the Ming dynasty in 1644. They considered them as unlearned barbarians. The Manchus, to raise themselves in the eyes of the Chinese, revived many old traditions and neglected works of art. The revival was under a modern sentimental influence, which in art related to agriculture, but enhanced the dignity of the occupation.

In 1689 the Manchu Emperor wrote a poem for each of the *Pictures of Plowing and Weaving*, that "These may be melodies for work and toil. In these pictures are shown the labors of the farmer which make his feet and hands calloused. All

[1] Riefstahl, Meyer R. The pictures of plowing and weaving. **Asia.** December, 1920, and January, 1921

is represented from the beginning until the end of the work of grain-growing and is rendered most exactly.

"I have ordered new plates to be cut and pictures to be put into circulation, so that sons and grandsons, officials and people may learn from them that the grain they eat was grown with toil.

"These pictures contain much that moves the heart. But I also wish them to make every one in the world proud of his work so that he applies himself eagerly to it and so that he is saving and gathering provisions."

The ten *Plowing* pictures reproduced in *Asia* are: The Watering of the Seed. The Harrowing. The Sowing. The First Shoots. The Replanting of the Stalks. The Watering. The Harvest. The Threshing (or beating) of the ears. The Hulling of the Grain. The Sacrifice to the Divinity. A commentary written by order of Emperor Chien Kung is given under each picture.

THE WATERING OF THE SEED

Commentary: There are three kinds of rice: sien, keng, and no. Every year the well-developed grains are selected from the harvested rice, dried in the sun and kept upon mats until the festival Tsing-ming. Then they are wrapped in rice-straw and laid in a pond, where they are watered for three or four days. Thereupon they are taken out and placed in straw baskets. On sunny and warm days they are sprinkled with (cold) water; if the weather is cold, with warm water.

As soon as the shoots are visible, the seed is ready for sowing.

This picture shows in the foreground a farmhouse on the bank of a stream, or a canal. The wife and children of the farmer are in the door; chickens are near. An old man leaning on a staff directs the work of two men, one of whom is standing in the water having just given to the man on the bank a well-made bamboo basket in which are the seeds. In the background are many carefully made rice paddies.

THE HARROWING

Commentary: An old agricultural rule says: "The plow is single, the spike six-fold." By "spike" is meant the harrow. When the plowing is ended, the entire plot is broken up with the iron-toothed harrow. The harrow has the effect of making the soil fine, so that the seeds can send roots into it. Hence the seed remains within the fine soil, and root and soil adhere to one another, so that even in drought the worms do no damage. Therefore people say: "Fine harrowing is the completion of the work". The man who harrows the field stands upon the harrow, in order that the iron teeth may go deep down into the ground.

The harrow in the picture is not large, only four rows of teeth. It is pulled by a carabao which wades through the muck of the paddy.

THE SOWING

Commentary: (After the first harrowing comes a second harrowing, and the field is rolled.) When the ground is entirely prepared, the watered seeds are placed in a ten-quart vessel. This is suspended from the left elbow, while the right hand takes out the seeds and scatters them. The seeds are sown, the sower always going forward, about a handful to three steps. For a mou of land, one needs three quarts of seeds. The most important thing in sowing is evenness, so that the shoots will not be too close or too far apart. Hence one speaks of "boundless sowing".

A charming Chinese landscape forms the background of this picture. In the foreground are two men sowing in exactly the manner described in the commentary.

THE FIRST SHOOTS

Commentary: When the first shoots come forth they are about a third of an inch long. First their color is white, but after eight or nine days they become green. Then the water is allowed to run over them to irrigate them. Throughout the night the water penetrates the seeds and makes the very sharp tips come forth like a rug made of bird feathers. If the shoots come forth at the time of the festival of Tsing-ming the plants will bear good fruit.

(After fertilizing, the plants are allowed to grow until they are six inches high. Then they are replanted.)

In the picture, in the foreground, on a broad path on a dike, two men and a boy, evidently three generations, are standing talking about the planted field. Out of the window of the farmhouse leans the farmer's wife also contemplating the "first shoots". Smoke peacefully floating from the house chimney adds realism to the farm scene.

THE REPLANTING OF THE STALKS

Commentary: The replanting of the stalks takes place at about the time when the plant begins to form ears. The bunches of stalks that have been pulled out are separated into bundles of from four to five stalks each, and these bundles are planted at a distance of from six to seven inches apart. The rows thus divided must be kept even and space must be left between them so that they can later be weeded. The workers doing the replanting must not make rapid movements with their feet. They can plant six bundles from one place by stretching out their arms; then they can gradually step back.

(The field is weeded three times.)

The six planters in the half-planted paddy in the foreground of the picture, with the planters in the partly planted paddy in the left background, make this a picture of action. The perfect regularity of the planted rows in the mucky mud is a true touch, as any one familiar with Chinese fields will recognize.

THE WATERING

Commentary: When the weeds are entirely done away with, the water dried out and the roots become hard, then one must think about watering the dry field at the right time. The mud, which has become hardened, is made soft and mushy by the water and before three or four days have passed, the rice stalks again stand forth luxuriantly. The tools used in this work are the chain pulley, the revolving bucket and the casting bucket, for drawing water from ponds (standing water); the conduit pipes and the conduit troughs for drawing water from mountain streams; the conduit wheel for drawing water from brooks; the log bucket and the pulley for drawing water from wells.

A man, in this picture, is drawing water with a bucket from a pond and pouring it on growing rice plants in paddy. A palm leaf fan lying beside the man's hat on the dike and his tense bulging muscles tell that "watering" is hard hot work.

THE HARVEST

Commentary: Kung says in his commentary upon the Shu King: "Sowing is called kia, reaping is called se." Sowing and reaping are the beginning and ending of the year's work. In the North, the millet is generally garnered late, and the rice is ripe rather early. In the South, the rice harvest is long delayed and the dry grain is comparatively early. As tools, spades and mattocks are used. Old and young join in the work, and even though the harvest is not yet gathered, still their eyes rejoice at the bounty of the crop. (After the harvesting, the barn is prepared for the threshing.)

In the picture, three men are busily cutting rice with curved sickles. Boys are gathering in bundles the cut grain. With a sheaf on each end of a pole carried

on his shoulder in the familiar way, a man bears the grain to the barn. An older man stands on the dike directing the work, apparently. By the side of the farmhouse are the farmer's wife and children, and in the background rise cultivated hill slopes.

THE THRESHING (OR BEATING) OF THE EARS

Commentary: When the harvest is cut, the straw is separated and the grains obtained. The garnered bundles are taken in the hands and are beaten upon something hard in order to get out the grain. Sometimes the bundles are laid upon the barn floor and an ox with a rolling stone is driven across them. One beats upon either a barrel or a stone slab. But if one wants to thresh, the flail is used. It is commonly used for wheat and rice. (After the threshing, the rice is sieved and thrown, in order to separate the grain from the chaff.)

Flails with two beating sticks are being used by the threshers. The stack, made like a *mandalá;* the bamboo baskets; the bamboo scoops; even the chickens stealing the grain; all make this a picture in no wise different from that seen on threshing floors in China today—or in the Philippines.

THE HULLING OF THE GRAIN

Commentary: A cover is made of woven bamboo and filled with mud. It has the shape of a small mill. Then bamboo and wooden sticks are arranged to form a system of closely set plugs. This is the machine that works by means of mud. Or pine wood is cut and bent so that it is like a large mill. Holes are bored in both discs, and spikes are fastened inside. This is the wooden hulling machine. A pole is inserted in the holes of the discs. A framework is erected above the machine and a movable frame is attached to it by ropes, by means of which the pole is moved back and forth. In one day this machine can hull forty to fifty piculs of grain.

A most interesting picture, full of life. Three men are turning the hand-mill. Others are winnowing the grain in shallow baskets, and children are romping and playing.

THE SACRIFICE TO THE DIVINITY

Commentary: When the work in the field is finished and the innumerable treasures have been gathered, the protection of the divinity must not be forgotten. Therefore the ceremony of the thanksgiving sacrifice takes place. Chicken, millet, and silk weaves are offered with singing and playing of instruments. Old and young perform their adoration together. Although the ceremony is different from the beating of drums and the blowing of trumpets of the melodies of Pin, its significance nevertheless resembles the calls upon the gods and the offerings and sacrifices in yellow cap and rural array.

In an old anthology of primitive Chinese poetry, the *Shi King*, which Confucius later edited, are poems describing "sacrificing to divinity," the ceremonies related to farming, particularly rice-growing, in the old kingdom of Pin. The processes of rice-growing are also described.

Not alone for information, for artistic beauty, are these *Plowing* pictures of value, of interest, but also for the revelation of the high place agriculture has ever held and now holds in this old, old country. Never in China has farming been looked upon as a lowly, undignified occupation.

OBSERVATIONS ON THE PHILIPPINE HORSE[1]

By Juan Lizaso

INTRODUCTION

There are three animals which are used as beasts of burden in the Philippine Islands, the carabao, the ox, and the horse. The horse has its place on the Philippine farm as well as the carabao and the ox, although it is not often used as a draft animal. Horses are used for the transportation of the owner or the manager from his residence to the farm, which is oftentimes at a distance, and in inspecting and supervising the work of the farm.

A great number of horses are used for driving, both in the country and the city, hitched to two-wheeled vehicles known as *calesas*, *carromatas* and *carretelas*, with accommodation for two or more passengers and driver. Many families in the Philippines earn their living by hiring out these vehicles and horses to the public. In places where there are no automobiles and places where they can not go the horse will always be an indispensable animal. It is then important to learn the good points and the defects of our horse, so as to have a basis on which to work for its improvement.

The latest figures given by the Bureau of Agriculture place the number of horses in the Philippines at 223,195 in 1915 and 203,430 in 1916 (1). Comparing this with our present population which is nearly ten million, we have about two horses for every hundred persons.

Observations were made on some horses, fairly representative of the type found in the Islands. These animals were picked at random in the towns of Los Baños, Bay, and Calamba, Laguna province.

According to Mackie (2), the first horses brought to the Philippines were from Malaysia. Later importations were from China and Japan. He gives Sumatra, one of the neighboring islands, as the place of origin of the Mindanao and Sulu horses. The horse of the Visayas and Luzon was introduced from China, Japan, and Mexico, whence horses were later brought to the Islands by the Spaniards. Some horses were probably brought to the northern part of the Archipelago from Mindanao. Mackie concludes that "the horses of the Islands, today, contain large or small amounts of characters from the Chinese, Japanese, Mexican (including various races entering into the race so designated), Persian, Indian, and Sumatran breeds". Durham (3) states that the Philippine horse is rather a composite animal, embodying many of the origin strains that have been the foundation material from several known and unknown breeds. It seems therefore that our horse is of a composite parentage and is accordingly varied in its characters, according to which blood has dominated in a locality.

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[1]Thesis presented for graduation from the College of Agriculture. No. 124; Experiment Station contribution, No. 55.

OBJECT OF THE PRESENT WORK

The object of this study was (1) to determine the conformation and the most common defects of the native horse; and (2) to study our horse for the purpose of learning its good points and defects, so that we may be able to formulate a program for improvement, by seeking to enhance its good points, and eliminating or minimizing its defects.

This study was carried out in the towns of Los Baños, Bay, and Calamba, province of Laguna. It covered a period of five months, from March to July, 1919.

TABLE I.—*Horses studied.*

Animals.	Los Baños.	Bay.	Calamba.	Total number determined.
Male	86	36	20	142
Female	7	1	0	8
Total number determined	93	37	20	150

MATERIALS

One hundred and fifty horses, one hundred forty-two males and eight females, were studied in this work. Ninety-three of these were from Los Baños. Thirty-seven from Bay and twenty from Calamba. Of the eight females, seven were from Los Baños and one from Bay. They were all used for light driving in *carretelas* and *calesas*. Five of the eight mares, including the one from Bay, were used for breeding and as pack animals. Most of these horses were of Batangas origin, and the rest were probably raised locally.

The horses observed in this work were in fairly good condition. There were some individuals which appeared to be underfed, especially among those from Los Baños, where there is a scarcity of feed during the hottest part of the year.

A wooden caliper was used to measure the height. This was marked in inches. To make the detailed and systematic observations, an outline was first prepared following the form of a score card. In this outline all the important defects, blemishes, and other unsoundness as points to be observed, are listed; and after each character there is a blank for recording the necessary notes. Several copies of this outline form were multigraphed before the work was started and one was used for each horse.

METHOD OF PROCEDURE

Before this study was started the writer practised making observations on a number of horses to familiarize himself with the work. It was at first a difficult task.

Examinations were made of the horses coming to the College Campus. Others were examined at the residence of the owner. With the outline indicated above, and caliper and pencil, the writer was able after some practice to make the observations on each horse in from 20 to 30 minutes or less.

The horse to be observed was gently approached and the halter, if there was any, was held. Then the horse was made to stand squarely. Some nervous horses were rather difficult to handle, but with caution it was possible even with these to make the observations.

Following the outline, the locality and the owner's name were recorded; then the sex, weight, and height. The weight was observed only in those horses examined on the College Campus; these were weighed on the stock scale of the Animal Husbandry Department. Then the height was taken by means of the wooden caliper at the highest point of the withers.

Whenever possible the age was determined from the certificate of registration. Approximately 20 horses were determined in this manner. When this was not possible, the age was determined in accordance with the approximate schedule given below. The mouth of the horse was opened and the necessary observations on the teeth were made. To open the mouth the tongue was held with two fingers of the right hand, and the lower lip held with left hand and lowered so as to open the mouth wide.

DETERMINING THE AGE OF A HORSE BY ITS TEETH

At birth	None.
At 1 year old	All temporary incisors out.
At 2 years old	All temporary incisors in full wear.
At 3 years old	Permanent pincher incisors out.
At 4 years old	Permanent intermediate incisors out.
At 5 years old	Permanent corner incisors out.
At 6 years old	Cups of lower pinchers worn out. Canines appear.
At 7 years old	Cups of lower intermediates worn out.
At 8 years old	Cups of lower corners worn out.
At 9 years old	Transition period.
At 10 years old	Cups of the upper pinchers worn out.
At 12 years old	Cups of the upper intermediates worn out.
At 13 to 20 years old	Determination of the age is by the angle of the teeth.

To determine the color the writer first consulted Gay's *Productive horse husbandry* (4). He then practised determining the color of a number of horses before making the actual observations.

The topic, *head* covers the mouth, muzzle, face, eyes, ears, and poll. Each of these parts was separately examined in detail for any of the possible defects named in the outline. As, for example, the "mouth" calls for "overshot" or "undershot". Examination for this was made by opening the lips and if the defect sought was not readily visible, it was felt for with the fingers. Other defects given in the outline which were not visible but could be felt with the hands were sought for in the same way. It needs trained eyes to see a wrong condition and a sensitive hand to find defects. Bone affection can not well be detected without the use of the hands. This is especially true in examining for splints and ring bones.

When bone spavin or blind spavin was suspected the hock test was performed. This was done by lifting up the suspected leg and holding it as close as possible to the body of the horse for about two minutes, and then run the horse. If the horse went lame it was considered an indication of the presence of a spavin.

DISCUSSION OF OBSERVATIONS

There was a preponderance of males among the horses observed. Very little horse breeding is carried on in this locality and it is very apparent that there is a decided preference for male horses for driving. There were only eight females among the 150 observed and three of them were used for driving.

It may not be amiss to state here that only one of the horses observed had been castrated.

WEIGHT

It was possible to obtain the weight of only thirty-five horses. The range of weight was from 366 to 564 pounds. This is a wide variation under the existing conditions.

TABLE II.—*Frequency distribution in weight.*

Class value.	Frequency.
pounds	
351–400	3
401–450	10
451–500	15
501–550	5
551–600	2
TOTAL	35

It appears that the most common weight is between 450 to 500 pounds, and that the average weight is 469.14 pounds or practically 470, or 213.63 kilograms. There were only three horses that weighed below 400 and there were seven horses the weight of which was above 500 pounds.

HEIGHT

Table III shows that the most common height was forty-nine inches. The average height was 48.703 inches. It may also be noticed that the sum of the frequencies from 48 inches to 50 inches is 86 or, in other words, 57.33 per cent of the horses observed had a height ranging from 48 to 50 inches.

TABLE III.—*Frequency distribution in height.*

Class value.	Frequency.	Frequency value.
inches		
45	4	180.00
45½	1	45.50
46	9	414.00
46½	9	418.50
47	11	517.00
47½	4	190.00
48	17	816.00
48½	18	873.00
49	20	980.00
49½	14	693.00
50	17	850.00
50½	7	353.00
51	11	561.00
51½	5	257.50
52	2	104.00
52½	1	
TOTAL	150	7,305.50
AVERAGE	—	48.703

AGE

Table IV shows the ages of the horses observed. The greatest frequencies observed were between the ages of 4 to 6 years. The average was, however, 6.96 or 7 years, which shows that the average age of *calesa* horses in these towns was 7 years. As shown in the table, the greater number of horses were from

2 to 6, and 8 years old. At the age of 2, there were sixteen horses, and at 3, fourteen, which indicates that many horses in this locality are put to work at an age as early as 2 years or between 2 and 3 years of age.

TABLE IV.—*Frequency distribution in age.*

Class value.	Frequency.	Frequency value.
years		
2	16	32
3	14	42
4	19	76
5	18	90
6	17	102
7	9	63
8	14	112
9	5	45
10	9	90
11	2	22
12	12	144
13	1	13
14	3	42
15	7	105
16	2	32
17	2	34
TOTAL	150	1,044
AVERAGE	—	6.96

COLOR

Table V shows that the commonest color was bay of varying shades, from light to dark. Eighty horses or about 53.33 per cent were of this color. Second common color was black, observed in 23 horses. Roan ranked third among the colors observed, red roan being the most usual. Sixteen horses were found to be

roan; fifteen horses were white; five brown; five chestnut; four gray; and one mahogany. There was one horse of unusual color which the writer was unable to name.

TABLE V.—*Frequency distribution in color.*

Color.	Number of individuals.
Bay	80
Light	14
Medium	28
Dark	38
Black	23
Roan	16
White	15
Brown	5
Chestnut	5
Gray	4
Mahogany	1
Undetermined	1
TOTAL	150

DISCUSSION OF OBSERVATIONS

HEAD

In the head the most common defect found was *overshot*, that is, the upper incisors or rather the upper jaw, projects in front of and beyond the lower jaw. The degree of projection varies from light to pronounced. *Undershot*, the opposite condition of overshot, was found to be not so common.

The *teeth* were not commonly defective. *Cut ears* were observed in three horses. In each case the cut was on the left ear. This may not be considered as a serious defect, but it mars the appearance of the horses.

NECK

The only blemishes that were observed on the neck were *collar sores*. By collar sores is meant sores made by an ill-fitting collar. These sores are caused by the carelessness of the owner.

SHOULDERS

Collar boils, have the same cause as collar sores.

CHEST

Practically no defect worthy of consideration was found in the chest. Scars were in seven cases.

FORELEGS

The most common defect found in the forelegs was the *base narrow position*: that is, the limbs run downward and inward forming a narrow base of support. Seventy-six horses or 50.66 per cent were found to be pronouncedly base narrow. Two other individuals were found to be slightly so. *Base wide*, the opposite condition to base narrow, was observed in two horses.

The *knees* in general were of good form, although 60 "buck-kneed" horses were found, 22 "calf-kneed" and the rest, or 68, had straight knees. Scars on the knees were observed to be very common. Almost one third of the 150 horses observed were found to have scars on the knees. Inquiries were made from the owners and *cocheros* as to the cause of the scars. Various answers were given. Some said that the horse had stumbled and fallen because the driver held the lines loose while the horse was going fast. Others said that the cause was a natural weakness of the animal; that is, if the horse is *tisudo* (stumbler) while he is young he is likely to be so throughout his life. *Tisudo* might be considered in this case as a general weakness of the knees. Any slight obstacle, such as a small stone, the men said, is likely to cause a horse having this character to stumble. The writer tried to note whether a buck-knee or a straight-knee conformation gave any special predisposition to stumbling and found that of the 60 buck-kneed horses, 34 or 56.66 per cent had scars; of the 22 calf-kneed, 13.63 per cent; of the 68 straight-kneed, 12 or 17.64 per cent.

These data may be tabulated as follows:

Condition.	Number of horses observed.	Percentage of the number observed.
		per cent
Buck-kneed	60	56.60
With scars	34	
Straight-kneed	68	
With scars	12	17.64
Calf-kneed	22	
With scars	3	13.63

These figures show of the three conformations that buck-knee is apparently the most predisposed to stumbling. It appeared to the writer, however, that the horses having scars on the knees were the older horses. Likely, age, hard work, carelessness, and buck-knee conformation were all contributory causes. Scars due to interfering were observed in the fetlocks of the front legs of 13 horses, three in the right leg and ten in both. When the wings of the shoes are not well rasped, oftentimes one foot strikes the other, causing wounds at the fetlocks.

BODY

Scalds were quite common especially in the place where the saddle is placed. *Girth sores* were also very common.

HIPS

Scars were observed on the hips of 14 horses; these were undoubtedly caused by whipping. Scars in all cases are avoidable and the cruel *cocheros* are the only ones responsible for this kind of a defect.

HIND-LEGS

As in the forelegs, the *base narrow* position was very common on the hind legs. *Bone spavin* was in 20 horses. *Bog spavin* and *blood spavin* were not found to be very common. *Cow-hock* was the most common defect found in the position of the hock, being observed in sixty-three horses. *Thoroughpin* was observed in three horses. *Windpuffs* were commoner in the hindlegs than in the forelegs. Marks due to *interfering* were commoner in the hind fetlocks than in the fore fetlocks. *Standing too far back* position was observed, in many of the horses.

SUMMARY

1. The conformation and the common defects as bone affection, blemishes, and other unsoundness, were observed in 150 Philippine horses in the neighboring towns of Calamba, Bay, and Los Baños, Laguna province.

2. The average age of the horses observed was 7 years. The greatest frequencies observed were between 4 to 6 years.

3. The most common color observed was bay, of varying shades, from light to dark.

4. The most common height observed was between 48 and 50 inches. Eighty-six horses, or 57.33 per cent of the horses observed, had a height within this range.

5. The most common weight observed was between 450 to 500 pounds. The average was about 470 pounds or 213 kilograms.

6. In the horses observed the head was well cut, although rather large for the body. The mouth was usually found sound. An overshot conformation was commonly observed. The nose was generally straight, sometimes Roman, rarely dished. The muzzle was soft and pliable. The nostrils were fairly wide open, and the lips even. The angle of the under jaw was fairly open. The eyes were usually full and bright. The ears were well carried and of medium size, except in half starved horses, where they lopped. The forehead was broad.

7. The neck was oftentimes large and heavy for the animal, but sometimes it was deficient in muscling. The shoulders were frequently thin or lean but not sweenied. The chest was generally deep and broad, although it was not uncommon to find narrow-chested animals.

8. The forelegs were usually good. The base narrow position and buck-knee conformation, however, were very common. The knees were generally of good form, although scars were often observed on them as a result of stumbling. The cannons were well defined, dense, and with a firmly fitting skin. Considering the hard work done by the horses, very few splints were observed. The fetlocks of both fore and hind legs were straight. Wounds or marks due to "interfering" were observed sometimes. The feet were of good size and with a dense horn.

9. The body was fairly capacious, of good barrel, and short coupled. The hips were wide, but not level. The croup was also wide, but short and sloping. The tail was well carried and of good length.

10. The hind quarters were generally deficient in muscling. This was especially so in the thighs and gaskin which were the weakest points observed. The hocks were often close together, making the animal cow-hocked.

11. As a rule the general conformation of the native horse is short, and rather low set, especially those of pronounced Chinese ancestry. They are of good quality, temperament, and disposition; with a wonderful stamina; and with very modest requirements of feed, care, and shelter.

CONCLUSIONS

The most common defects found in the native horse, as seen around Los Baños, were:

1. A comparatively large head, and an overshot mouth.
2. A buck-knee or knee sprung conformation.
3. Base narrow conformation in both fore and hind legs.
4. Deficiency in size and muscling of hind quarters.
5. Cow-hocked conformation of hindquarters.

The most notable good points observed were:

1. Excellent quality of skin and bone.
2. Deep chest.
3. Roomy barrel and consequent ability to stand roughage feed when under hard work.
4. Wonderful stamina and recuperating power.

RECOMMENDATIONS

1. Young horses should not be worked regularly at so early an age as two years. They may be taught to do light work at the age of three, and worked regularly only when past three years old.
2. The native horse should be given better feed and care.
3. The Philippine horse should be improved by good breeding, by selecting the best stallions, and mating them with good mares.
4. The defects, buck-knee conformation, base narrow position, and lack of general muscling in the thighs and gaskins, etc., should be reduced by properly selecting the breeding stock.
5. Better care should be exercised in the selection and use of harness, as ill-fitting harness causes blemishes and undue irritation and suffering to the animal.

ACKNOWLEDGMENT

The writer desires to express his obligations to Prof. B. M. Gonzales, under whom this work was undertaken, for his valuable suggestions and criticisms.

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TENANCY ON COCONUT HOLDINGS IN THE MUNICIPALITY OF LOOC, PROVINCE OF ROMBLON[1]

By Evett D. Hester and Gerónimo M. Miñano

INTRODUCTION

Of the many rural problems which present themselves to the citizens of an agricultural country none is more important than those that rest on the systems of land tenure. The special problem of tenancy arises wherever settlement has proceeded beyond the most primitive stages. The question involves on one side the entire field of farm efficiency, and on the other a long chain of social and hence political conditions.

The existence of tenancy is considered by some as natural and inevitable for the reason that (a) land does not increase in supply, (b) population increases, and (c) there results a rural landless population which can be absorbed only through the development of industrialism.

Taylor (1) believes that, in general, young farmers are not financially able to own that amount of land which they can operate to best advantage, while the older farmers have more land than they wish to farm. Ely (2) is of the opinion that tenancy is better than encumbered ownership, although he believes that there is a minor disadvantage of tenancy. An advantage of tenancy as found in several studies in the United States, especially by Spillman and Goldenweiser (3) and Taylor (1), is that it is a step towards ownership.

While there are certain advantages of tenancy, there are also well indicated disadvantages. The disadvantages generally given are: (a) it encourages a class of non-property holders who do not make the best and most peaceful citizens; (b) in the United States and Ireland it was found, at least by Johnson (4), Boyce (5), and Taussig (6), that owners are better farm operators than tenants. The contract length of tenancy in each of the countries is generally one year, and because the tenants are not assured of staying longer on the land they are operating, they do not venture to make improvements either in equipment or soil. A third (c) disadvantage is that tenants generally have less capitalization, fewer implements, and work animals applied to each acre than has the land owner; and (d) in almost all cases tenants destroy the fertility of land and thus decrease the production in general.

As to the Philippine Islands, the importance of tenancy may be demonstrated by comparing the statistics of the number of agricultural holdings as given by the United States Bureau of the Census (7) for 1903 and by the Census Office of the Philippine Islands (8) for 1918.

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1 Thesis presented by Gerónimo M. Miñano for graduation from the College of Agriculture, No. 125; Experiment Station contribution, No. 56.

TABLE I.—*Showing the number of agricultural holdings in the Philippine Islands operated under ownership and under tenancy in 1903 and 1908.*

Year.	Total holdings.	Ownership.	Tenancy.	Proportion of tenancy.
				per cent
1903	815,453	685,543	129,910	19.24
1918	1,955,276	1,520,026	435,250	22.26

Table I indicates the increase in tenancy during the last fifteen years. This figure becomes more impressive when it is realized, according to Census Office of the Philippine Islands (8), that only about eight per cent of the area of the Islands is under cultivation; an additional seven per cent is included in the private owned farm area, but not cultivated; about fifteen per cent is cogon or second growth grass land. This last area is land ready for the plow and offers a standing argument for a rapid decrease of Philippine tenancy which is not taking place. Spillman and Goldenweiser's (3) conclusion that in regions where desirable public land can be acquired for a nominal cost, tenant farming is not an important problem, is nullified as regards the Philippines by several historic and social characters which are briefly summarized.

1. The Malaysian settlement of the Islands involved the migration by water of related persons forming in the new land a *barangay*[2] in which the entire economy and control of the land was vested in a chieftain and instituting a primitive form of communal tenure if not actual peonage.

2. The establishment of the *encomienda*[3] by the Spaniards immediately after the conquest. This institution was primarily of a tax-collecting local-government character but contained all the essentials of peonage.

3. The destruction by the Church of the *encomienda* system and the substitution of the typical friar estate. This movement was accomplished during the eighteenth century, and while superior to the *encomienda* system was of undoubted weight in encouraging, systematizing, and extending tenancy in the Islands.

4. The granting of large areas of land to deserving natives, mestizos, and grandees by the Spanish crown mostly on the model of the friar estate. This practice was followed with increasing vigor during the latter half of the eighteenth century and the entire nineteenth century and is accountable in no small degree for the present caciquism in central Luzon and parts of the Visayas.

5. The gregarious nature of the Filipino which induces his preference for insufficient holdings and a highly social village system to wider farms and probable isolation.

6. Marked inefficiency of legislation and administration relative to opening public lands—a condition obtaining since the days of Magellan down to the present time.

It is beyond the scope of this paper, however, to document and analyse the foregoing causes; they are presented as a possible satisfaction of the enigmatic condition of growing tenancy coupled with wide areas of normally usable public land.

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[2] A Malaysian term meaning originally a boat, but as applied in the Philippine Islands, a hamlet, thus implying the mode of settlement.

[3] Spanish term applied to a politico-agrarian form of tenure instituted largely in Mexico and the Philippines.

The Philippines experience the gravity of tenancy problems not only in the mere increase in number of tenants in the face of a large and fertile public domain, but also in the politico-social aspect of a heightening class consciousness among the *aparceros*[4] and *arrendatarios*[5] in whom there lies at this hour potentiality for the formation of either a strong middle class of freeholders, or a strong troublesome class of peons, less numerous but more effective, than the peons of Mexico. Wise legislation and a meticulously just agrarian administration, alone, can adduce the former rather than the latter.

Recently, there have been many published accounts of tenant protests in the Philippines. In July, 1920, the demands of tenants resulted in the division of the former friar estate of Cauayan. It was doubted that the division would aid in the decrease of tenancy to any considerable extent, as it was expected that rich proprietors from Pampanga, Pangasinan, Ilocos Sur, and Ilocos Norte, besides those from Isabela province, itself, where the hacienda is located, had made known their intention to purchase portions of the land.[6]

During the latter half of 1920, 500 tenants of San Juan del Monte marched to the palace of the Governor General to protest against increased rents of from six to forty-seven pesos per square meter per annum.[7] A settlement of this case was finally made through the good offices of the Governor General.

In the same month, the Governor General received a petition from 5,000 tenants of the Nagtahan estate in the districts of Sampaloc and Santa Mesa complaining against alleged increases in rents of from 500 to 1,200 per cent.[8]

In October, 1920, 5,000 tenants from the estates occupied by the Solocan Development Company marched to the Governor General's palace to place in his hands a petition requesting the Government to purchase the land concerned and sell it back to the tenants.[9]

"The Payatas estate in Rizal province was reparceled and taken up by the tenants themselves during the month of October, 1920."[10]

PAST LITERATURE ON THE SUBJECT IN THE PHILIPPINES

There is only one complete work in English that includes a consideration of the subject of tenancy in the Philippines. This is Miller (9) who gives one chapter to the entire subject of land tenure. In this chapter he considers two problems: (a) the size of the parcels and (b) the system of cultivation with respect to laborer, owner, and country. In 1903 the average size of farms was 3.5 hectares. There are four systems of renting land in the Philippines:

1. Renting of land outright, a very limited system.

2. The manorial system. Under this system "the tenant has the use of a certain piece of land allotted to him by the owner. The product of the land is his own, to do with as he likes. No rent is paid, but the tenant is obliged to work for the landlord a certain part of the time, for which he receives wages."

3. The *kasama* system. In this system the land is leased for a share of the crop. "The relationship of father and child may describe the attitude of land-

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4 A Spanish term for share tenants.
5 A Spanish term for tenants paying a specified rent, either of money or labor.
6 **Manila Daily Bulletin**, July 9, 1920.
7 **Manila Daily Bulletin**, September 28, 1920.
8 **Manila Daily Bulletin**, September 7, 1920, and **Philippines Free Press**, September 11, 1920.
9 **Manila Daily Bulletin**, October 11, 1920.
10 **Manila Daily Bulletin**, October 11, 1920.

lord and tenant to each other. The landlord is paternal, the tenant filial. Nevertheless, each looks out for his own interest. The amount of land leased is usually one or two hectares. The agreement between tenant and landlord in most cases is verbal, and the length of tenure is usually indefinite in nature. The division of the crop in this system "is usually based on a valuation of one-third for labor, one-third for work animal, and one-third for the improved land."

4. The share system of scattered holdings. In this system the financial and general condition of the tenant is much better than on the large estate.

Comparing the peasant proprietor to the tenant in citizenship, Miller finds that the condition of the peasant proprietor is better than that of any other tillers of the soil (tenants and hired laborers).

OBJECT OF THE PRESENT WORK

In order to advise correctly an agrarian policy adequate for the country, it is necessary to elaborate the meagre tenancy statistics which have been set forth by the two recent censuses of the Islands, that of 1903 (7) and 1918 (8), with the results of specific surveys levied on each area of considerable agricultural production. The Department of Rural Economics of the College of Agriculture has undertaken with the present paper to break the way for these surveys. It can not be expected that the Department using only student personnel can nearly complete so extensive a task. It does plan, however, to undertake some score of such surveys, using students on vacation time, with the idea of developing a method of operating a generalized survey.

The immediate object of the present work was to survey the tenancy conditions obtaining on coconut plantations in the municipality of Looc, Romblon, bringing out the following points:

1. The average area of a tenant holding.
2. The average uncultivated area of a holding.
3. The food crops, intercrops, or side crops grown by the tenants.
4. The average length of tenancy.
5. Whether there is sufficient blood and marriage relation between the present tenants and the former tenants to indicate inheritance of holdings and the existence of a definite tenant class.
6. Whether there is sufficient relationship both by blood and marriage between tenants and landlords to indicate that tenancy is a step towards landownership, and to argue against the existence of a purely tenant class.
7. Whether tenants as a rule own land, and if so, whether their ownership is sufficient to indicate tenancy as a step towards ownership.
8. The terms of the agreements between landlord and tenant, and the typical contract of the locality.

The survey was made in the municipality of Looc, Romblon, during the period from April 15 to June 2, 1920.

METHODS OF SURVEY

The tenancies studied in this work were coconut holdings. At the beginning it was intended to survey every tenant coconut holding found in the municipality, the total number being in the neighborhood of one hundred and thirty. It was soon realized, however, that time did not permit the surveying of all of them, and it was decided to take representative holdings from each barrio in proportion to

its total number of holdings. The selection was also made so as to exclude from the survey holdings grossly atypical, and to confine the survey to normally productive holdings. In the end it was found possible to cover more units than was expected and a total of 96 were investigated.

The tenant holdings surveyed were distributed over the entire municipality which consists of eight barrios. Table II shows the distribution of the holdings surveyed, together with the total of such holdings in each of the eight barrios. From this table it may be seen that the greater number of holdings surveyed is located in the barrios having the greater number of total holdings. In other words, the number of holdings surveyed in each barrio is, in general, in proportion to the total number of holdings of each barrio.

TABLE II.—*Showing distribution of tenant holdings surveyed according to barrios, with estimated total number of holdings in each barrio.*

Barrio.	Total tenant holdings on coconut producing land.		
	Total.	Surveyed.	Unsurveyed.
Alcantara	37	30	7
Punta	25	18	7
Pili	21	15	6
Santa Fe	14	11	6
Guimbirayan	11	8	3
Tugdan	11	8	3
Buenavista	7	3	4
Agojo	4	3	1
TOTAL	130	96	34

In order to systematize and detail the study of the subject, a questionnaire was prepared. A copy of the questionnaire was used for each tenant holding surveyed.

In obtaining the data the junior author, with copies of the questionnaire, visited each tenant holding. The data were largely obtained from the tenants themselves, only occasionally from the landlord. Out of 96 units the data for 80 were furnished by the tenants, 15 by landlords, and 1 by a landlord's representative. The data given by the landlords were always verified by checking the more important items with one or two of their tenants and in all cases it appeared to be accurate.

In the personal interviews with both tenants and landlords, in obtaining the data, no difficulty of any kind was encountered. Each one was willing to give the necessary information asked, and as far as could be judged, the figures were accurate.

Considering the total number of days of the survey, the average number of interviews made a day was two.

RESULTS OF THE SURVEYS

LOCATION, AREA, AND CROPS BY UNITS AND BARRIOS

The first point of the survey was to discover the size and crops of the various units and to total and average them by barrios.

The number of units surveyed in each barrio is shown in Table III. It has been mentioned above, in the method of survey, that the greater number of holdings surveyed were located in the barrios which have the greater number of total holdings, the barrio of Alcantara had the greatest number and the barrio of Agojo, the least number.

Besides the names of the barrios, Table III shows the total area of units surveyed in each barrio; the maximum and minimum size holdings; and the averages. It shows also the total area under cultivation, the maximum and minimum size of the cultivated portions of the holdings, and the averages. In the same table, under primary crops, are placed the total and average areas devoted to coconut, the number of units with their total and average areas devoted to rice, the number of units with their total and average areas devoted to corn.

The table shows also the number of units in each barrio which produced secondary crops, classified according to crop.

It may be seen from Table III that the total area of the units varies from 40 to 1,500 ares, the total area of all units being 41,520 ares or 415.2 hectares. There may also be seen in Table III the range of total areas in different barrios. But, although there is this variation in the range, the average total area for each barrio (with two exceptions) does not differ very much from the average total area of all holdings, which is 432 ares, as shown in the table. The exceptions are, the barrio of Tugdan with eight units falling below the average and the barrio of Buenavista with three units lying above the average.

TABLE IV.—*Showing frequency of total area, cultivated area, and area devoted to coconut.*

Class.	Total area.		Cultivated area.		Coconut area.	
	Number of units.	Proportion.	Number of units.	Proportion.	Number of units.	Proportion.
ares		*per cent*		*per cent*		*per cent*
150 and under	16	16.6	25	26.1	57	58.3
151– 300	41	41.7	43	43.7	25	26.1
301– 450	14	14.6	12	12.5	6	6.3
451– 600	6	6.3	11	11.5	5	5.2
601– 750	3	3.1	2	2.1	0	0
751– 900	3	3.1	1	1.0	1	1.0
901–1050	3	3.1	1	1.0	2	2.0
1051–1200	5	5.2	0	0	0	0
1201–1350	1	1.0	1	1.0	1	1.0
1351–1500	5	5.2	1	1.0	0	0

TABLE III.—*Showing area and crops of units surveyed by barrios.*

Barrio.	Number of units surveyed.	Total area.				Cultivated area.				Primary crop area.								Number of units producing secondary crops.	Number of units having as secondary crops.									Number of plantings of secondary crops.
										Coconut.		Rice.			Corn.													
		Total.	Maximum.	Minimum.	Average.	Total.	Maximum.	Minimum.	Average.	Total.	Average.	Number of units.	Total.	Average.	Number of units.	Total.	Average.		Banana.	Camote.	Buri Palm.	Jack Fruit.	Bamboo.	Citrus.	Pineapple.	Mungo.	Cacao.	
		ares	*ares*	*ares*	*ares*	*ares*	*ares*	*ares*	*ares*	*ares*	*ares*		*ares*	*ares*		*ares*	*ares*											
Alcantara	30	10010	1500	50	334	6500	700	50	217	4180	139	14	2240	160	5	180	36	14	8	1	6	3	2	2	0	0	0	22
Punta	18	7060	1500	40	448	5060	1300	40	284	3680	204	10	1380	138	0	0	0	5	4	5	0	1	0	0	0	0	0	10
Pili	15	6880	1400	150	459	5930	1400	50	395	4150	283	8	1430	179	3	250	83	7	1	2	4	1	2	1	1	1	1	14
Santa Fe	11	6300	1200	180	573	3730	750	150	403	2880	162	8	720	103	2	70	35	6	3	6	0	2	0	0	0	0	0	11
Guimbirayan	8	5700	1400	200	512	2520	550	70	315	2050	256	4	450	112	0	0	0	4	2	3	0	1	1	0	1	0	0	8
Tugdan	8	1650	400	50	206	1650	400	50	206	950	119	5	620	124	2	80	40	1	1	0	0	0	0	0	0	0	0	1
Buenavista	3	2600	1400	400	666	2200	1000	400	733	2200	733	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Agoja	3	1320	920	200	440	900	500	200	300	650	217	2	250	125	0	0	0	2	1	1	0	0	0	0	0	0	0	2
All barrios	69	41520	1500	40	432	28490	1400	40	297	20840	217	51	7090	139	12	580	48	39	20	18	10	8	5	3	2	1	1	68

The average area of all units, however, does not clearly show the prevailing area of the holdings. It can be shown better by the highest frequency, or most common size.

Table IV shows that the most numerous group is that comprising from 151 to 300 ares which contains 41.7 per cent of all units.

The group of 150 ares and under, and that of 301 to 450 ares, which contain 16.6 per cent and 14.6 per cent respectively, are the second and third frequency groups. The rest of the groups each have but from 1 to 6.3 per cent of the total units.

Again, Table III shows that the cultivated portions of the units varied from 40 to 1,400 ares. The total cultivated area was 28,490 ares or 284.9 hectares giving an average cultivated area of 297 ares as against an average total area of 432 ares. Again, using the frequency method, Table IV shows that the prevailing cultivated area is from 151 to 300 ares and that 69.8 per cent of the cultivated areas fall below 300 ares.

The primary crops grown in the tenant holdings were coconut, rice, and corn. Since the object of this work was to discover the tenancy conditions on coconut plantations of the place, it would, of course, be expected, as was the case, that every unit surveyed should have a coconut crop.

From Table III it is seen that the area devoted to coconut, totaled for the different barrios, varied from 650 to 4,180 ares. The averages for the barrios ranged from 139 to 733 ares. The averages for five barrios fell between 200 and 300 ares, which approached closely the average of the total. The averages for the other three barrios, Alcántara, Tugdan and Buenavista, were 139, 119, and 733 ares respectively. Table III shows that the total area planted to coconut was 20,840 ares, or 208.4 hectares, and the average was 217 ares. Considering the most common area planted to coconut, Table IV shows that the area group of 150 ares and under, and the area group of 151 to 300 ares, give 58.3 and 26.1 per cent respectively. None of the other groups gives more than 6.3 per cent of the total.

Rice was the second most important crop grown by the majority of the tenants. In all there were 51 units in which rice was one of the primary crops. The total area was 7,090 ares, or 70.9 hectares, and the average for the 51 holdings was 139 ares. With the exception of Buenavista, every barrio had a certain number of units in which rice fields formed a part. The area devoted to rice, totaled for the different barrios, except Buenavista, varied from 250 to 2,240 ares. The averages for these barrios ranged from 103 to 179 ares.

Corn was also grown but to a very limited extent. An examination of Table III shows that of the 96 units surveyed, only 12 produced corn. The total for corn was 580 ares; the average being 48 ares. Table III indicates further that corn was grown in the units of only four barrios: Alcantara, Pili, Santa Fe, and Tugdan. These four barrios had totals of 180, 250, 70, and 80 ares respectively in corn. The averages in the same order were 36, 83, 35, and 40 ares.

Less than one half of the units surveyed produced secondary crops. From Table III it may be seen that there were 39 units that produced one or more of the secondary crops mentioned in the table. These are distributed as follows: Alcantara, 14; Punta, 5; Pili, 7; Santa Fe, 6; Guimbirayan, 4; Tugdan, 1;

Agojo, 2. Of 20 units which produced banana, 8 are located in the barrio of Alcantara, 4 in Punta, and the remaining 8 are scattered. Of 18 units which produced camote; 6 are located in Santa Fe; 5 in Punta; 3 in Guimbirayan; 2 in Pili; and 1 each in Alcantara and Tugdan. Of 10 units which had buri palms, 6 are located in Alcantara and 4 in Pili. Of 8 units which produced jack fruit, 3 are located in Alcantara; 2 in Santa Fe; and 1 each in Punta, Pili, and Guimbirayan. Of 5 units which produced bamboo, 2 are located in Alcantara; 2 in Pili; and 1 in Guimbirayan. Of 3 units which produced citrus, 2 are located in Alcantara and 1 in Pili. Of 2 units which produced pineapple, 1 is located in Pili and 1 in Guimbirayan.

A summary of Table III shows that there were 22 plantings of secondary crops in the units surveyed in the barrio of Alcantara, 14 in those of Pili; 11 in those of Santa Fe; 10 in those of Punta; 8 in those of Guimbirayan; 2 in those of Agojo; and 1 in those of Tugdan.

LENGTH OF TENANCY

A second problem of land tenancy rests upon the length of residence of the tenant on his holding. The facts connected with this point should bring out an answer to such a question as: "To what degree are tenancies permanent?"

TABLE V.—*Showing maximum, minimum, and average length of tenancy for barrios and for the municipality of Looc.*

Barrio.	Total surveyed	Length of tenancy.			
		Total.	Maximum.	Minimum.	Average.
		months	*months*	*months*	*months*
Alcantara	30	2,160	144	2	72.0
Punta	18	758	72	2	32.1
Pili	15	920	180	4	63.1
Santa Fe	11	336	96	3	30.6
Guimbirayan	8	170	48	2	21.2
Tugdan	8	424	96	12	53.0
Buenavista	3	192	120	24	64.0
Agojo	3	360	192	48	120.0
All barrios	96	5,140	192	2	53.5

The results of the questionnaire as they apply to length of tenancy are summarized in Table V, which shows that for all units surveyed the maximum length of tenancy was 192 months, the minimum, 2 months, and the average 53.5 months. Further, the maximum lengths of tenancy for the different barrios varied from 48 to 192 months, the minimum lengths varied from 2 to 48 months, and the averages from 21.2 to 120 months. The averages for the barrios in order of length, are Agoja, 120 months; Alcantara, 72 months; Buenavista, 64 months; Pili, 63.1 months; Tugdan, 53.0 months; Punta, 32.1 months; Santa Fe, 30.6 months; and Guimbirayan, 21.2 months.

Using Table V, as a basis, a frequency of tenancy lengths was computed and is set forth in Table VI.

TABLE VI.—*Indicating the frequency of lengths of tenancy.*

Class.	Number of units.	Percentage.
months		
1 to 24	35	36.4
25 to 48	24	25.0
49 to 72	13	13.5
73 to 96	9	9.5
97 to 120	4	4.2
121 to 144	8	8.3
145 to 168	0	0
169 to 192	3	3.1

There appears a difference between the prevailing length of tenancy as shown in Table VI and the average as shown in Table V. In Table VI, the length of tenancies has been grouped into classes of 24 months each, with the number of units occurring in each class and their percentages. The table indicates that 35 units fall in the class, 1 to 24 months, 24 units fall in the class, 25 to 48 months, 13 units fall in the class, 49 to 72 months, and the rest are distributed among the 4 other classes, excepting class, 145 to 168 months, which has none. Classes, 1 to 24 months, and 25 to 48 months, taken together, contain 59 units, or 61.4 per cent of all the units surveyed.

LAND OWNERSHIP AMONG TENANTS

It is frequently said that tenancy is a step toward ownership. Taylor (1) writes, "While tenancy is common at the present time and has been present in the United States since the beginning of our nation, it has ever been looked upon merely as a stepping stone, a temporary means of acquiring the use of land, and not as a permanent condition for any individual."

An investigation covering all 96 units of the survey was made as to land ownership among the tenants to discover whether tenancy in the area surveyed does lead to ownership. The following items show the result of this part of the survey:

Number of tenants owning land	17
Percentage of tenants owning land to all tenants	17.5
Total area of land owned by tenants	4,390 ares.
Area of land owned by tenants, average for land-owning tenants	258 ares.
Area of land owned by tenants, average for all tenants	45.7 ares.
Total area of land owned by tenants under cultivation	3,690 ares.
Area of land owned by tenants under cultivation, average for land-owning tenants	217 ares.
Area of land owned by tenants under cultivation, average for all tenants	38.4 ares.

RELATIONSHIP BY BLOOD AND INTERMARRIAGE BETWEEN TENANTS AND PREVIOUS TENANTS AND BETWEEN TENANTS AND LANDLORDS

As having a bearing on the general conditions of tenancy, it is necessary to find out to what extent the tenants in a locality constitute a permanent strata, or class in the society. The existence of such a class could be argued if there were a general inheritance of holdings from father to son. Any extensive blood or marriage relations between landlord and tenants would stand against the argument that there is a non-landed, peon class. Galpin and Hoag (11) write: "In estimating the advantages and disadvantages of the American system of tenancy, it has been urged of late that an analysis of all tenants in a community will show a certain rather constant proportion of the tenants to be related to the landlord. ..... (this) it is worth mentioning, confirms the contention that much tenancy is a *modus vivendi* of a near relative, and a procedure quite satisfactory to both parties, if not always in reality a step toward ownership wherein inheritance plays a distinct rôle."

TABLE VII.—*Showing relationship by blood and marriage between tenants and previous tenants, and between tenants and landlords.*

Relationship.	Number of tenants related.	Number of units giving data.	Proportion.
			per cent
Tenant to previous tenant:			
Wife	2		
Son	2		
Step-son	1		
Son-in-law	3		
Brother	1		
Brother-in-law	1		
Nephew	1		
TOTAL	11	69	15.9
Tenant to landlord:			
Son-in-law	4		
Brother-in-law	1		
Sister-in-law	1		
Nephew	1		
Nephew-in-law	1		
Cousin	2		
TOTAL	10	96	10.4

Table VII gives the degree, number, and proportion of relationships both by blood and by marriage existing between tenants and previous tenants and between tenants and landlords. From all units returning data on this question there were 11 tenants who were related to the previous tenant; the proportion for the survey being 15.9 per cent.

There also appear in Table VII four tenants who were sons-in-law to the landlord, one who was a brother-in-law, one who was a sister-in-law, one who was a nephew, one who was a nephew-in-law, and two who were cousins. From all units returning data on this question there were 10 tenants who were in some way related to the landlord, the proportion for the survey being 10.4 per cent.

THE CONTRACT

The contract between landlords and tenants is the most important problem in land tenancy. Its importance is thus valued by Gray and Turner (12), "Some students of the land question believe that even in an ideal system of land tenure a considerable proportion of tenancy would be desirable provided that the relationship of landlord and tenant were such as would insure good farming, the conservation of the soil, a fair division of the product and a progressive community life of which the tenant is an essential part.

"It is too much to expect that such a desirable relationship can be established merely by improvement of the lease contract, but it must be admitted that since the lease agreement is the basis of the relationship between landlord and tenant, a careful consideration of its terms may have much to do with promoting harmony and mutual satisfaction, lengthening of the period of occupancy, and improving the methods of farming rented land."

For purpose of clearness the contract of this survey are considered under these heads: (1) Terms regarding coconut; (2) Terms regarding rice; (3) Terms regarding corn; (4) Terms regarding secondary crops; and (5) Types of coconut contracts. The first four deal with the arrangements between landlord and tenant regarding the culture and division of profits of each of the principal and the secondary crops. The fifth head describes a series of contracts which may be accepted as typical of the district surveyed.

COCONUT TERMS

All the terms of the contracts between landlords and tenants regarding coconut were found to be verbal. The length of tenancy was not specified. It was understood to be continuous from year to year unless either party gave notice to end the tenancy. On coconut holdings the tenancy could come to an end at any time of the year, but in most cases it was understood to be possible immediately after a harvest.

Land tax.—In no case was the tenant required to pay the taxes upon the land. There was, however, one landlord with four tenants who required a sliding-scale tax on the productivity of his land which he, the landlord, applied toward the total land tax. The scale was as follows: If the tenancy produced 1500 to 2000 nuts quarterly (that is every three months), the tenant contributed ₱2.50 per annum; if 2000 to 2500 nuts quarterly, the tenant contributed ₱3.50 per annum; if 2500 to 3000 nuts quarterly, the tenant contributed ₱4.50 per annum; if 3000 to 3500 nuts quarterly, the tenant contributed ₱5.00 per annum.

Clearing.—The clearing, which consists generally of the cutting of grass and brush, and the gathering and burning of dry coconut leaves was done by the tenants in all units.

Harvesting.—In 73 units out of the 96 surveyed, the tenant did the harvesting. If he did not actually do the harvesting he stood for its cost. In 16 units it was the landlord who paid the cost, and in the remaining 7 units

the landlord and tenant together bore the cost, that is, they divided the cost of harvesting between them equally.

Making of copra.—In 71 units the products were marketed in the form of copra. In 62, out of the 71 units, the tenant made the copra, in 3 units the landlord stood for the cost, while in the remaining 6 units the landlord and tenant together bore equally the cost of making the copra.

Planting and replanting.—The planting and replanting was done either by the landlord or by the tenant. In 52 units the landlord stood the cost of planting and replanting. In 44 units planting and replanting were done by the tenant.

Transportation of the copra.—In the 96 units there were 25 in which no transportation of copra was involved prior to the division. In these cases either a third party, a buyer, or the landlord himself purchased the copra at the site of production.

Dealing only with those units in which copra was transported before division of the crop, there were three systems for the transportation of the copra from the place of production to the site of the market.

(1) The first system may be called simple cartage. In this case the site of production is inland and the site of the market is the *población*[11] of Looc. Out of the 96 units of the survey there were two which involved this system of transportation. The system uses two items of equipment, a sledge and a carabao, and requires a certain amount of labor. In both of the units the sledge was owned by the tenant, the carabao was owned by the landlord, and the labor was supplied by the tenant or, if outside labor was employed, the tenant did the hiring and paid for it.

(2) The second system employed in the transportation of copra was by means of sailboat. In this case the site of production is near a water port and the market can be more easily reached by water than by land. In 53 units out of the 96 surveyed, transportation of copra was by water shipment. In all the 53 units the boat and labor were supplied by a third party for a definite charge. In one unit this cost was borne by the landlord; in 10 units, by the tenant; and in 42 units it was equally divided between the tenant and the landlord.

(3) The third system involving both cartage and water transportation applied to 16 units. In all units under this system the sledge was owned by the tenant. In 15 units the work animal was owned by the landlord and in one unit it was owned by the tenant. In all the 16 units the labor was supplied by the tenant, or if outside labor was employed, the tenant did the hiring and paid for it. The boat and labor in the part of this system which involved the water transportation, as in the second system, was supplied by a third party for a definite charge. In all the 16 units the water transportation cost was equally divided between the tenant and landlord.

Miscellaneous terms.—It is customary that the tenant can use nuts for home consumption, without being charged for them. He is even allowed to use two trees for toddy if he cares to. Similarly, the landlord can obtain nuts for home consumption without being charged by the other party. He can also require toddy from the tenant.

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[11] Spanish term applied to the central part or capital of a municipality.

There were 10 units in which the tenant was supplied with two or three carabaos which he could use without paying anything to the landlord, but he had to take care of them and the animals could not be worked on any one else's land unless the tenant rented that particular parcel of land. The tenant did not receive any share of the natural increase of the animals. In these 10 units the tenant was obliged to sell his share of the crop to the landlord at 25 centavos less than the current price per 100 nuts.

Division of the crop.—There were 37 units in each of which the tenant received one half of the product. In all the tenant received the share in the form of money. In 58 units the tenant received one third of the product, in 33 units in the form of money and in 25 in the form of commodity. In the remaining unit the tenant received two fifths of the product in the form of money. The division of the crop in all units was delayed until the actual sale had been made. When the copra or nuts were sold on the site, division was made immediately after the sale, when transported to a distant market the division was not made until the money from the sale had been received.

The crops of the holdings were divided between the landlords and tenants either in the form of money or in the form of commodity. In 71 units the tenant's share was in the form of money, and in 25 units it was in the form of commodity.

RICE TERMS

In 50 units of the 96 surveyed, the tenants produced rice. The rice land belonged either to the owner of the coconut grove which the tenant held, or it belonged to a third party. It was sometimes a continuous part of the holding and in other cases was in a separate place. Some rice fields were as far as four kilometers from the house of the tenant. The rice parcels were all for lowland rice, and were planted only once every year.

The rice contracts, like the contracts regarding the coconut, were verbal. Also the length of tenancy was not specified. The rice side of the tenancy could only be terminated between the time of harvest and planting.

Land tax.—In all units the tax of the rice land was paid by the landlord.

Work animals.—The landlord in 39 units supplied the work animals. In ten units the tenant owned the carabaos, and in one unit the animals were supplied by the tenant and landlord together, that is, the landlord and tenant each supplied one carabao.

Plowshare and moldboard.—The plowshare and moldboard were supplied by the landlord in 35 units, by the tenant in 13 units, and by the tenant and landlord together in two units.

Body of the plow.—For this purpose the body of the plow may be defined as the whole less the plowshare and moldboard, in other words the wooden part of the native plow. This part of the plow was supplied by the tenant in 49 units and by the landlord and tenant together in one unit.

Bamboo harrow.—This implement was supplied by the tenant in all units, except one, in which it was supplied by landlord and tenant together.

Cost of outside labor during planting.—The outside labor during the planting included the pulling up of seedlings, topping, transplanting, sometimes har-

rowing, and other work connected with the culture. In 40 units the landlord and tenant both stood for the cost, while in 10 units the tenant alone bore the cost.

Reaping, hauling, threshing, and winnowing.—Again in 40 units, the landlord and tenant together, and in 10 units the tenant alone, bore the cost of reaping, hauling, threshing, and winnowing.

Seed.—There were 10 units in which the tenant alone supplied the seed, and there were 40 units where the seed was supplied by both the landlord and tenant.

Division of crop.—In all units having rice fields, the rice product was divided in the form of unhulled rice, or paddy. In four units the landlord received five cavans of paddy for every hectare of land planted. In this case all cost of production was borne by the tenant, except land and land tax. There were six units in which all the product went to the tenant; as in the preceding case, the tenant bore all cost except land and land tax. In 40 units the tenant received one half of the product. The division was in all cases in the form of commodity as no marketing process was involved.

CORN TERMS

Only 11 units out of 96 surveyed cultivated corn. In three units of the 11, the landlord supplied the work animal, and in the other eight units the tenant owned the carabao. The plow was owned by the landlord in three units, and by the tenant in eight units. The bamboo harrow was owned by the tenant in all of the 11 units. The seed was supplied by the landlord in three units and by the tenant in eight units. There were three units in which the tenant received one half of the product; there are three units in which the tenant received two thirds of the product; and there were five units in which the tenant received all of the product. The division in all cases was in the form of commodity.

SECONDARY CROP TERMS

There were 39 units that had secondary crops. In most cases these crops were grown as intercrops in the coconut grove or as garden crops near the tenants' houses. In the case of buri palm and bamboo, without exception, the tenant was allowed to use them for home consumption only. In the case of banana, camote, jackfruit, mango, citrus, pineapple, and cacao, the tenant received all the products except in three units. But always the landlord could require a certain amount for his own use from the tenant. In two units of the three exceptions, the tenant received one third of the product, and in one, the tenant received one half of the product.

TYPES OF COCONUT CONTRACTS

As the summary of contract terms shows, in the municipality of Looc there were many different kinds of coconut contracts between the landlord and the tenant presenting altogether a great variation of terms. For the purpose of considering types of contracts on the tenancies in Looc, only terms that were applying to the coconut crop will be dealt with as a basis for finding the typical contracts. In the rice and corn terms it was not possible to find any definite types at all. The authors think it advisable to leave out the rice and corn terms for the following reasons:

In the first place, this paper is dealing primarily with coconut holdings; in the second place, the coconut terms of the agreements were separate and distinct from any rice or corn terms, rice and corn being only secondary crops as far as the landlords and the tenants were concerned; in the third place, the land devoted to the crops would show that rice and corn were certainly secondary to coconut, as is shown by the fact that the average coconut area per holding was 2.17 hectares or 2170 ares, while the average area devoted to rice and corn together, was only .81 hectares or 810 ares.

Of these contracts, five which, together, included 59 of the 96 units surveyed have been selected as type contracts and are here discussed.

Type I.—Under this type of contract the tenant did the cleaning of the coconut grove, the harvesting of the nuts, the making of the copra, and the planting and replanting of coconut trees. Units operating under this type of contract were water front groves and no cartage was involved, the copra being carried to the sailing vessel by the tenant or members of his family. The cost of transportation by sailboat was divided equally between the landlord and the tenant. The tenant received one half of the product in the form of money. This type of contract existed only in the eastern part of the municipality, particularly in the barrios of Alcantara and Tugdan. There were 19 units under this type of contract.

Type II.—The tenants under Type II contracts were responsible for the cleaning of the holding, the harvesting of the nuts, the making of copra, and the planting and replanting of coconut trees. Under this form of contract, cartage was involved in the transportation of the copra from the grove to the water front because the units involved were at some distance from the sea. The landlord supplied the carabao and the tenant supplied the sledge or cart and performed, or hired and paid for, the necessary labor. The cost of transportation of the copra by means of sailboat was borne equally by the tenant and the landlord. The tenant received one half of the product in the form of money. This type of contract was found only in the eastern part of the municipality, in the barrios of Guimbirayan, Alcantara, and Tugdan. Under this type of contract there were nine units.

The only difference between this type of contract and the first type is the additional land cartage of the copra which the difference in location made necessary.

Type III.—Under this contract the tenant did the cleaning of the grove. The landlord bore the cost of harvesting of the nuts. There was no copra made under this type. The cost of planting and replanting of coconut trees was borne by the landlord. No transportation was involved in this contract. The tenant received one third of the product in the form of nuts. There were 11 units found operating under this contract.

Type IV.—Under this type of contract, the tenant did the cleaning of the grove and harvesting of the nuts. No copra was made under this contract. The landlord bore the cost of planting and replanting of coconut trees. No transportation was involved. The tenant received one third of the product in the form of nuts. Eleven units came under this type.

Type IV differs from Type III in one thing only, in Type IV the tenant bore the cost of harvesting while in Type III it was borne by the landlord.

Type V.—Under this type of contract the tenant did the cleaning of the grove, the harvesting of the nuts, and the making of the copra. The landlord bore the cost of the planting and replanting of coconut trees. No cartage was involved in the transportation of copra. The cost of transportation of copra by means of sailboat was borne equally by the tenant and the landlord. The tenant received one third of the product in the form of money. There were nine units which fell under this type of contract.

The reason why contracts of Types I and II differ very much from Types III, IV, and V is not due to difference in soil fertility as might be supposed, but to two different groups of landlords. In the eastern part of the municipality the majority of the landlords are natives of the municipality of Romblon who have migrated to Looc, and who prefer the types of contract on coconut holdings to which they were accustomed in their native town of Romblon. The landlords in the western section of the municipality are natives of Looc and prefer the types of contract which have long been customary in the town.

DISCUSSION OF RESULTS

The main results shown by the surveys reported in this paper apply only to the district surveyed and at the time of the survey. Very great differences exist throughout the different regions and in the growth of the different crops in the Philippines. A much wider survey would be needed to make general conclusions.

AREA AND CROPS

From the results of the surveys it was found that the average cultivated area of all the holdings was 297 ares while the average total area was 432 ares. The average total area of all holdings was greater by 31.1 per cent than the average cultivated area. This shows that the municipality of Looc, as a whole, had still about 31.1 per cent of its land, included in tenant holdings, uncultivated. Of this area of uncultivated land, it is the opinion of the authors that practically all of it is suitable for cultivation, being largely second growth forest and cogon.

The average, however, does not clearly show the prevailing area of holdings, but Table IV shows that the most common size of holdings came under the classes 151 to 300 ares and 150 ares and under, which classes together contained 57 units out of 96. As to the cultivated area, classes 151 to 300 ares, and 150 ares and under, contained 68 units out of 96. The prevailing total area of holdings then was the same as the prevailing cultivated area. The difference lay only in the numerical frequency which was greater in the prevailing cultivated area, being 68, than in the prevailing total area, which was 57. This shows that the greater uncultivated areas were found in the larger holdings.

It was also found that the average of the cultivated area of the units in each barrio was less than that of the average of total area, with the exception of the barrio of Tugdan where the entire area of all units was under cultivation. The uncultivated area of the units of each barrio, not including Tugdan, varied from 14 per cent to 38.5 per cent of the total area.

The average area planted to coconut was 217 ares, but the frequency table gives area group 150 and under as the most common size, as this class contained 58.3 per cent of all units.

Fifty-three and one-tenth per cent of the tenants not only produced coconuts but also produced rice. The average area planted to rice was 74 ares for the

96 units surveyed or an average of 139 ares for the 51 rice-producing units. Twelve and five-tenths per cent of the tenants produced corn with an average area of 5.5 ares for the 96 units surveyed or an average of 48 ares for the 12 corn-producing units.

The planting of rice and corn by the tenants shows that they can not depend upon coconuts, alone, for their living. There are two reasons for this: First, copra is not remunerative except when shipped to Romblon or to Manila direct in great quantities and as a consequence there is frequently a considerable delay in completing an exchange and also frequently stringency of credit. Second, the distance of the place from the rice markets is quite far and the transportation is so difficult and uncertain that when rice reaches the local market the price is very high.

LENGTH OF TENANCY

Fifty-three and five-tenths months was found to be the average length of tenancy, but the frequency table of all the lengths of tenancies reveals that 36.4 per cent of all the units surveyed showed a tenancy length of two years or less. The length of tenancy was comparatively short, and might be in part due to the fact that the contracts had no provision as to the length of tenancy. Either the tenant or landlord could end the tenancy at any time of the year. Short tenancy contracts without any specification as to when the tenancy should end have great disadvantages for both the tenant and landlord. The tenant will not spend any extra energy in cutting weeds and brush nor in improving the land by constructing fences and planting secondary crops and intercrops that are more or less permanent, because he does not know whether he will be on the holding long enough to enjoy the benefits from them.

LAND OWNERSHIP OF TENANTS

Ownership of land among tenants will show whether tenancy is a step towards land ownership or not. The results of the surveys show that 17 of the tenants owned land, with a total area of land owned of 4,390 ares. This certainly is not an indication that tenancy in Looc leads to ownership. This conclusion may be based upon a mathematical computation. The computation was made in the following manner: First, 45.7 ares, the average area of land owned by tenants, was divided by 4.5, the average length of tenancy in years. The result of this division, which is 1.01, is the average area acquired per year per tenant. Then by dividing 432 ares, which is the average area of a tenant holding, by 1.01, the area acquired per year per tenant, the result, 42.7, is the average number of years required for a tenant to become the owner of land equal to his tenancy holding. It would therefore take the average tenant at his present rate of land acquisition almost twice the span of his normal productive life, 25 years, to become the owner of an area of land equal to tenancy holding the time of survey.

INHERITANCE OF HOLDINGS

Tenancies in Looc were found not to be inherited. The argument for this is: (a) The average length of tenancy is too short. A tenant's son before he can inherit a tenancy must be about 18 years old, and, therefore, the average length of tenancy must be around that figure if inheritance of the tenancy is to prevail. Table V shows the average length of tenancy in Looc to be less than four and one-half years. (b) There were only 11 tenants or 15.9 per cent that were

related to the former tenants and there were only two cases in which it was possible for direct inheritance to have occurred since there were only two tenants that were sons of the previous tenants. This fact would not indicate the growth of a soil-attached peon class such as is found in Mexico and other Spanish-colonized regions. It is said that any extensive blood or marriage relation between landlord and tenant would stand against the argument that there is such a permanently non-landed or peon class. In this survey, the fact is that 10 tenants or 10.4 per cent were related to the landlords. This also argues against the existence of a permanent tenant class in the place studied.

THE TYPICAL COCONUT CONTRACT

The purpose of this part of the paper is to find out the one most typical contract on coconut holdings in Looc. This question could not be answered by a selection of one of the five types, as treated above, because no one of them could reasonably be set up as representing a typical contract for the place. The most typical of the five types applied to only 19 units which was rather far below a fair number of the units surveyed.

Reference to pages 160 to 162, where the contracts are treated under their separate terms, shows that taking any one phase of a contract there is likely to be a good many units agreeing on the same term. To make this clear, Table VIII has been prepared as a summary of the two sets of data under terms of contracts and under types of contracts.

TABLE VIII.—*Indicating the agreement of units to types and terms of contracts on coconut holdings.*

Phase of contract. \ Type of contract.	I.	II.	III.	IV.	V.
Number of units agreeing in terms concerning:					
All phases	19	9	11	11	9
Cleaning of grove	96	96	96	96	96
Harvesting of nuts	73	73	16	73	73
Making of copra	62	62	25	25	62
Planting and replanting of trees	44	44	52	52	52
Transportation	42	16	25	25	42
Division of crop	37	37	58	58	58

Table VIII requires a note of explanation. Across the top are indicated the types of contracts, each contract consisting of a fixed set of terms as tabulated on pages ..... to .... In the left column are the statements of the different phases of contracts and at the right under the head of each type is given

the number of units the terms of which agree with that of the indicated phase of the indicated type. The data for agreement of terms of the different phases are from page 164.

Examination of Type I in this table indicates that while only 19 units agreed with this type in all terms, 96 agreed with its term regarding cleaning of the grove; 44, as regards planting and replanting of trees; 73, as regards harvesting of nuts; 62, as regards making of copra; 42, as regards transportation; and 37, as regards division of crop.

If each of the other types is considered, a similar condition is found to exist in all types. It can be seen that if one typical contract is to be found it must be based upon a selection of terms, not all of which are to be found in any one type of contract.

Table VIII shows that in making the composite typical contract we must accept the terms for planting and replanting of trees from Types III, IV, and V; the terms for harvesting of nuts from Types I, II, IV, and V; the terms for copra making from Types I, II, and V; and the terms for division of crop from Types III, IV, and V.

The composite typical contract would appear as follows:

Terms	Units agreeing
1. Cleaning of the grove by tenant	96
2. Harvesting of nuts by tenant	73
3. Making of copra by tenant	62
4. Planting and replanting of trees by landlord	73
5. Transportation by sailing vessel, cost equally borne by the tenant and landlord	42
6. Division of the crop on basis of one-third to tenant	58

A further treatment of the units as regards their agreement with the various terms is made by scoring them. Certain percentages are allowed for complete agreement with the terms of the composite typical contract and partial credit is given for modifications. The total of percentages of any one unit can not be more than 100.

Table IX shows the method employed in scoring the units. Because of lack of space this table is not complete and is intended only to show the method of scoring. It is unnecessary to present the scoring of all units of the survey as the averages are given in Table X.

In Table IX, 10 per cent is given to cleaning when it was done by the tenant, 5 per cent when it was done by the landlord and tenant, and zero per cent when it was done by the landlord alone.

The harvesting is credited 10 per cent when it was done by the tenant, five per cent when it was done by the landlord and tenant together, and zero per cent when it was done by the landlord.

TABLE IX.—*Typical contract score sheet for ten selected units.*

Terms.	Maximum grade allowed.	Unit.									
		1	*4*	*5*	*11*	*23*	*26*	*32*	*39*	*54*	*58*
	per cent										
Clearing of the grove: by tenant	*10*	10	10	10	10	10	10	10	10	10	10
Harvesting of nuts: by tenant	*10*	10	10		10				10	10	10
By tenant and landlord	5			5			5				
By landlord	0					0		0			
Making of copra: by tenant	*20*		20		20	20			20	20	20
By tenant and landlord	10			10			10				
By landlord	0	0									
No copra made	10							10			
Planting and replanting of trees: by landlord	*10*	10		10	10	10	10	10	10		10
By tenant	0		0							0	
Transportation: by boat with cost borne equally by tenant and landlord	*20*			20	20						20
By boat with cost borne by landlord	0	0	0								
By sledge with sledge owned by tenant, labor furnished by tenant, carabao owned by landlord	20					20	20		20		
By sledge with sledge owned by tenant, labor furnished by tenant, carabao owned by landlord; and by boat with cost borne equally by tenant and landlord	20									20	
By sledge with sledge owned by tenant, labor furnished by tenant, carabao owned by tenant; and by boat with cost borne equally by tenant and landlord	16										
Cost borne by buyer	0							0			
Division of the crop: tenant received one-third	*30*	30		30	30	30	30	30	30		
Tenant receives two-fifths	24										24
Tenant receives one-half	15		15							15	
Total or percentage of typicalness		60	55	85	100	90	85	60	100	75	94

The making of copra is allowed 20 per cent when it was done by the tenant, 10 per cent when it was done by the tenant and landlord, and zero per cent when the cost was borne by the landlord alone. When no copra making was involved 10 per cent is given.

Ten per cent is credited to the planting and replanting when the cost was borne by the landlord, 5 per cent when the cost was equally divided between the tenant and the landlord, and zero per cent when it was done by the tenant.

The cartage of copra, if any, and when no shipment by boat was involved, is allowed 20 per cent when the landlord supplied the carabao, and the tenant supplied the sledge and the labor. When any one of these three ownership features were changed six and two-thirds per cent is deducted for each change. When the transportation included shipment and no cartage was involved, 20 per cent is allowed when the cost was borne equally by the landlord and tenant. If it was borne by either tenant or landlord alone it is given zero per cent. When

cartage and shipment were involved in the transportation of the copra, for a change in the ownership of any one of the three features in the cartage there is a deduction of 4 per cent, and for a change in the ratio of payment in the shipment there is also made a 4 per cent deduction.

The division of the crop is credited 30 per cent when the tenant received one third of the product, and a proportional value is deducted for any deviation from the ratio either above or below.

The total of the credits given to each term of a contract gives the grade or the degree of typicalness of the contract of a unit in its relation to the established composite typical contract.

The sum of the grades for any one term divided by 96 gives the typicalness of that term. The sum of the total grades of all units divided by 96 measures the typicalness of the composite typical contract. These averages are shown in Table X.

TABLE X.—*Average scores for terms of typical composite contract.*

Terms.	Maximum grade allowed.	Average grade for 96 units.
	per cent	*per cent*
Cleaning of the grove: by tenant	*10*	10
Harvesting of nuts: by tenant	*10*	7.6
By tenant and landlord	5	.3
By landlord	0	0
Making of copra: by tenant	*20*	13.1
By tenant and landlord	10	.6
By landlord	0	0
No copra made	10	2.5
Planting and replanting of trees: by landlord	*10*	5.4
By tenant	0	0
Transportation: by boat with cost borne equally by tenant and landlord	*20*	8.8
By boat with cost borne by landlord	0	0
By sledge with sledge owned by tenant, labor furnished by tenant, carabao owned by landlord	20	.4
By sledge with sledge owned by tenant, labor furnished by tenant, carabao owned by landlord; and by boat with cost borne equally by tenant and landlord	20	3.1
By sledge with sledge owned by tenant, labor furnished by tenant, carabao owned by tenant; and by boat with cost borne equally by tenant and landlord	16	.2
Cost borne by buyer	0	0
Division of the crop: tenant receives one third	*30*	18.1
Tenant receives two-fifths	24	.3
Tenant receives one-half	15	5.8
Typicalness for typical composite contract		76.2

V. SUMMARY OF CONCLUSIONS

1. The average size of tenant holdings in Looc was at time of survey 432 ares or 4.32 hectares. A majority of the holdings, fifty-seven out of ninety-six, however, were 300 ares or less in size.

2. The municipality of Looc as a whole had still about 31.1 per cent of its land, included in tenant holdings, uncultivated, the greater portion of which was in the larger holdings.

3. The tenants in the locality cannot depend upon coconuts alone for their living, and rice or corn or both were grown on 55 holdings out of 96.

4. The length of tenancy was comparatively short, averaging 53.5 months.

5. Land ownership among the tenants is insignificant and does not indicate that tenancy in Looc leads to ownership.

6. As far as the survey is concerned there is no indication that a permanent non-landed, or peon class exists on the coconut holdings of Looc. At least, there was no indication of general inheritance of holdings and about two-thirds as many tenants were related to the landlord as were related to the former tenant of the same holding.

7. No actual typical contract is found for the place but a theoretical composite contract as given in this paragraph is found to be 76.2 per cent typical for the survey. The terms of the contract are: (a) cleaning of the grove by tenant; (b) harvesting of nuts by tenants; (c) making of copra by tenant; (d) planting and replanting of trees by landlord; (e) transportation by sailing vessel, cost equally borne by the tenant and landlord; and (f) division of crop on basis of one-third to tenant and two-thirds to landlord.

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ABSTRACT[1]

The atis moth borer (Heterographis bengalella Rag.), HILARION ESTALILLA (*Thesis presented for graduation from the College of Agriculture, No. 126; Experiment Station contribution No. 57*).—The author worked on *Heterographis bengalella* Rag. with a view to finding a possible control of the insect. The emphasis of his work lies, for the most part, in the life history of the insect; this was worked out in the insectary at the College of Agriculture.

In this abstract, an attempt has been made to bring out only those points which are of most importance.

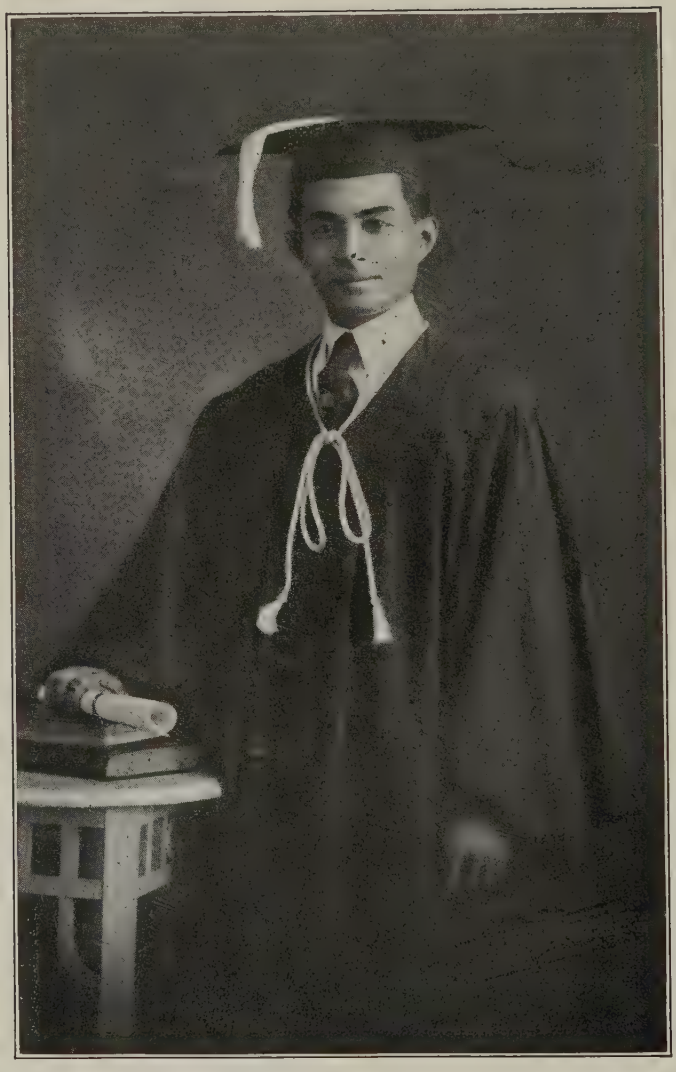
The atis moth borer, *Heterographis bengalella* Rag., is the most destructive insect pest of atis at Los Baños, and possibly throughout the Islands. It has been reported also from Bhutan and Calcutta, India. In the Philippines, the insect is fairly well distributed throughout the Archipelago, destroying atis, guayabanos, and anona fruits. At Los Baños, the damage is from 22 to 100 per cent. The damage is done by the larvae, which eat and tunnel the interior of the fruits. The attacked fruits may be distinguished by the presence of the frass, which is held together by means of fine silk, on the surface of the fruits.

The eggs are laid singly as a rule (although two or three may be laid together in a mass), in the sutures and on the stems of the fruits, and rarely on the leaves. The eggs hatch in from four to five days. The larvae, upon hatching, bore at once into the fruit, frequently making new tunnels until their third molt, when each larva makes one continuous tunnel inside the fruit. It is after the third molt that the most serious damage is done. This damage is such that the fruits almost invariably fail to develop, and in severe cases, they fall. In from 12 to 19 days after hatching, the larva is full grown, measuring about 19.5 millimeters in length and 2.6 millimeters in diameter. The larvae then make cocoons in the tunnel near the epidermis of the fruit where they pupate. . The larvae pass through four molts before pupating. The moths emerge 12 days after the pupation. The possibilities of control of the insect seem to lie principally in the collection and burning or burying of the attacked fruits.

Abstract prepared by Silverio M. Cendaña.

[1] **The Philippine Agriculturist** begins with this issue the publication of abstracts of theses and contributions prepared by students as a part of the required work in English 4 of the College.

Knowledge without judgment is labor lost.



LEON BAYOT VILLANUEVA

IN MEMORY: LEON BAYOT VILLANUEVA

Leon Bayot Villanueva was born July 17, 1896, at Amadeo in the province of Cavite, eldest son of Primo Villanueva and Ramona Bayot. He was educated in the primary school of Amadeo, at Indang Farm School, and, in 1914, matriculated in the College of Agriculture, University of the Philippines, from which institution he received, in 1920, the degree of Bachelor of Agriculture. After graduation, in 1920, Mr. Villanueva was appointed Assistant in Tropical Pomology and entered upon his studies for a Master's degree, assuming as well his duties as a faculty member.

To the deep regret of all his associates, ill health compelled him to leave the College in August, 1920. On September 7, 1921, he died at his home in Amadeo, survived by his father, mother, three brothers and three sisters.

Resolutions were adopted by the Faculty of the College of Agriculture as follows:

Whereas, the late Leon Bayot Villanueva was for many years associated with the College of Agriculture of the University of the Philippines in the capacity of student and later as a member of the teaching staff; and

Whereas, the said Leon Bayot Villanueva was always favorably known and highly esteemed among all his associates for his high moral character, his earnestness of purpose and his successful work as a student and teacher; and

Whereas, on September seven, nineteen hundred and twenty-one, death severed these cherished associations in the work for Philippine agriculture; therefore be it

Resolved, that we the members of the Faculty of the College of Agriculture do hereby express deep sorrow not only for our personal loss which is shared with his family and many intimate friends but also for the great loss to the Philippines in the early cutting off of this life that was so full of promise for service in his chosen field of Agriculture; and be it further

Resolved, that these resolutions be spread upon the records of the Faculty; that a copy be sent to the family of the deceased; and that a copy be submitted to the *Philippine Agriculturist* for publication.

Signed at the College of Agriculture, Los Baños, Laguna, Philippine Islands, the Tenth Day of October, Nineteen Hundred and Twenty-one.

Resolutions were adopted by the Student Body of the College of Agriculture as follows:

Whereas, it has been the will of Almighty God to deprive us of the companionship of Mr. Leon Bayot Villanueva, B. Agr., Graduate Assistant in Agronomy, and Member of the Student Body of the College of Agriculture, University of the Philippines; and

Whereas, in his passing away we have forever lost his valuable help as a member of the Student Body and as a friend; and

Whereas, he holds a place of respect, love, and admiration in the hearts of all of us; Therefore be it

Resolved, that we, members of the Student Body of the College of Agriculture, University of the Philippines, do hereby express our sorrow for the death of Mr. Leon Bayot Villanueva; and be it further

Resolved, that we extend our sincere sympathy and condolence to the bereaved parents and relatives in their grief; and be it further

Resolved, that a copy of these resolutions be sent to the parents of the deceased; a copy be spread in the minutes of the Student Body, and a copy be published in *Philippine Agriculturist*.

Dated at the College of Agriculture, Los Baños, Laguna, this Eighteenth Day of October, Nineteen Hundred and Twenty-one.

Resolutions were adopted by the College of Agriculture Alumni Association as follows:

Whereas, by the untimely death of Leon B. Villanueva, B. Agr., 1920, which occurred in Amadeo, Cavite, on September 7, 1921, the College of Agriculture Alumni Association has lost one of its members; and

Whereas, the late Leon B. Villanueva, by his pleasing personality, friendly disposition, and gentlemanly conduct, had always commanded our friendship and admiration and proved himself a pleasant co-worker and good companion; and

Whereas, his early departure from us has cut short his association, the memory of which we still cherish; therefore be it

Resolved, that we hereby express our grief for his death; and be it further

Resolved, that this resolution be spread on the minutes of this Association; that, as a sign of respect, a copy thereof be sent to the bereaved family of the deceased; and that copies thereof be submitted to the *Philippine Agriculturist*, the *Philippine Farmer* and the *Alumni News* for publication.

Signed at the College of Agriculture, Los Baños, Laguna, Philippine Islands, the Thirteenth Day of October, nineteen hundred and twenty-one.

COLLEGE AND ALUMNI NOTES

Prof. Harold C. Cuzner has been transferred to the School of Forestry as Professor of Dendrology. He entered the College of Agriculture at the time of its establishment. In the College he was Professor of Agricultural Engineering, head of the Departments of Engineering and Mathematics, in charge of construction and transportation. He planned and supervised the construction of practically all the permanent buildings on the campus. The College will always look on Professor Cuzner as one of its "Founders".

Irving A. Leonard, a graduate of Yale-Sheffield, has been appointed Professor of Agricultural Engineering *vice* Professor Cuzner.

Professor Emma S. Yule, head of the Department of English, has been granted a year's leave of absence beginning at the end of the present school year.

Assistant Professor Brenton of the Department of English was transferred from teacher's to accrued leave basis at the October session of the Board of Regents.

Mr. Augustin Llenado was appointed Instructor in Spanish at the August session of the Board of Regents. Mr. Llenado attended the College of St. Joseph in Manila and completed his education in Spain at the Collegium Veruleuse of the Society of Jesus. Prior to coming to the College he was on the faculty of the Ateneo de Manila.

Silvestre Asunción, B. Agr., 1911, has received the degree of Master of Science from the Audubon Sugar School, University of the State of Louisiana. He is now taking a course in tractor engineering in Detroit. After further study in the Bureau of Standards at Washington, D. C., and practice in Cuba and Hawaii, he expects to return to the Philippines and work for the Bureau of Agriculture.

Severo Mariano, B. Agr., 1919, is now working near San José, California, and will enter the Audubon Sugar School this year.

The College of Veterinary Science has established an Ambulatory Clinic in the town of San Pablo, Laguna, where a considerable number of cases are treated every Saturday forenoon by clinic students under the direction of the faculty members.

In the last number of the *Agriculturist* in connection with Derecho: *A Biological Study of Copra Meal,* acknowledgment should have been made to Cornelio del Rosario for preparation of charts reproduced therein. The error was due to oversight on the part of the editors.

The Second Annual Intramural Track Meet has been announced. The three mile cross-country run will take place on October 22 and the full schedule will be held on October 28 and 29. The meet is under the patronage of the residents of Faculty Hill.

On October 8 the Agriculture baseball team defeated teams from the Laguna and Batangas Provincial High Schools. These were the first games in the Laguna League.

The Student Body celebrated on October 10 the anniversary of the enlistment *en masse* of the students of the College of Agriculture in the Philippine National Guard in 1918. The day was named Loyalty Day and was made a holiday for the College by official action.

At 8:00 p. m., in Botany Hall, Mr. Gil Opiana gave a series of reminiscences of Guard days, Deans Kalaw and Baker and President Benton delivered short addresses defining and emphasizing the spirit and value of loyalty and patriotism. The College orchestra played several selections.

The Agriculturist has received the above snapshot which should prove of interest to all alumni and old students. Who are they?

FRONTISPIECE. OPEN COOKED TUBER OF A SEEDLING VARIETY OF SWEET POTATO SELECTED FOR FLAVOR AND HIGH COLOR OF FLESH.